
Installing the hardware

Installation should proceed in the following order:

- install Base Stations and Base Station plug-top power supplies
- install remote power interconnect units
- install Base Station plug-top power supplies
- install external antennas and lightning surge arrestors
- install a Companion Administration Terminal
- install a Remote Access Device
- wire the Time Compression Multiplexing lines
- install Meridian Companion cards

Note: If you plan to use Companion Manager instead of or in addition to the Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

Installing Base Stations

Before installing a Base Station, verify its position as recorded on the *Meridian Companion Programming and Provisioning Record*.

Installation guidelines

ATTENTION!

Each Base Station must be installed within 1 200 m (TCM wiring length) of the Meridian Companion system.

Consider the following points when installing Base Stations:

- Ensure that the installation complies with your local electrical code.
- Install Base Stations indoors where there is no condensation and the temperature remains between 0°C and 50°C.
- Install all Base Stations within 1 200 m (wiring length) of the Meridian 1 system.
- Do not position Base Stations on large concrete or marble columns. Base Stations must be at least 1 m from such columns. Locate all Base Stations at a cell center on the same side of such columns.
- Position Base Stations on ceilings, or upright against walls close to the ceiling on surfaces with the same material composition.
- Allow a clearance of at least 9 cm between the Base Stations and surrounding objects, excluding other Base Stations (see Figure 2 on page 14).
- Position all Base Stations at the same cell center a minimum of 1.5 m apart from the center of one Base Station to the center of another (see Figure 2 on page 14).
- Do not mount Base Stations in rows.
- If there are one or two Base Stations at the cell center you can install the Base Stations upright on a wall or on a ceiling.
- If there are three or four Base Stations at the cell center, install them on the ceiling.

- Do not position Base Stations in ducts, plenums, or hollow spaces used to transport environmental air.
- Position Base Stations away from where a portable is used in an office area by at least the amount shown in Table 1. Installing Base Stations on ceilings or high on walls helps to maintain these minimum distances.

Table 1: Minimum distance between office areas and Base Stations

Number of Base Stations in the cell	Minimum distance between office areas and Base Stations
1	1 m
2	1.4 m
3	1.8 m
4	2.0 m

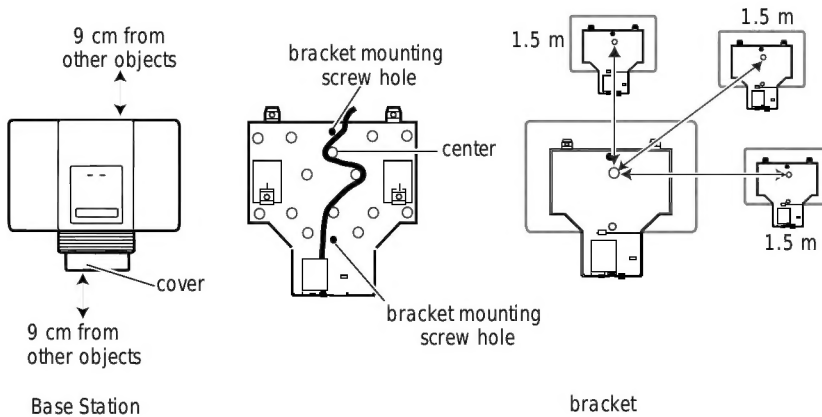
Powering a Base Station

Base Stations can be powered by plug-top power supplies or remote power interconnect units. See “Installing remote power interconnect units” on page 16 or “Mounting a Base Station plug-top power supply” on page 31 for your configuration.

Mounting a Base Station

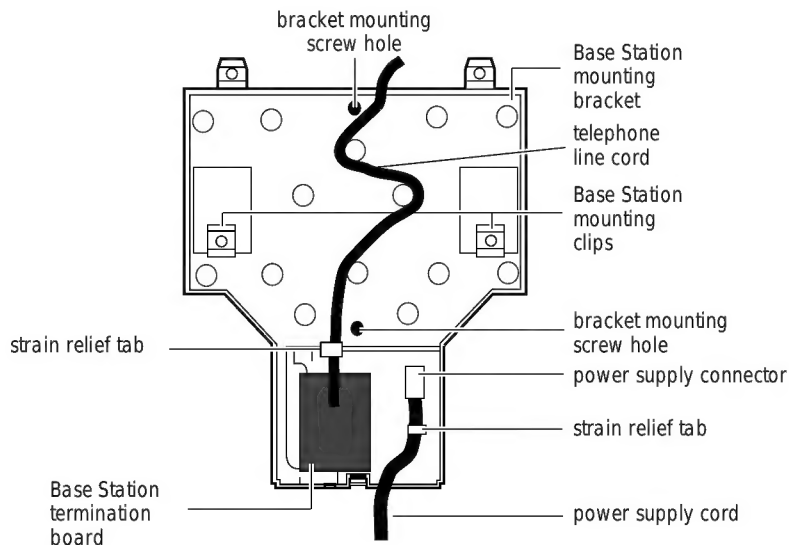
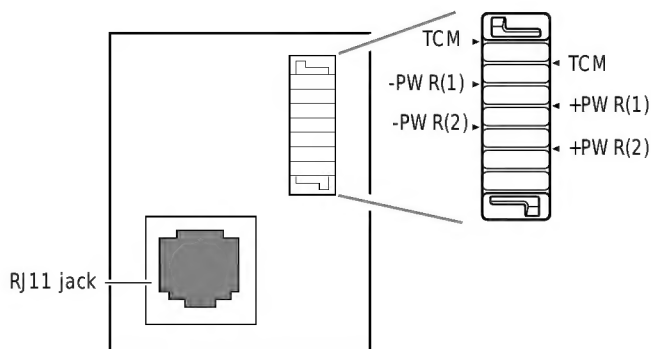
Base Stations can be mounted on a wall or on a ceiling. When mounting on a wall, install it with the cover at the bottom, as shown in Figure 2 on page 14. Allow for the following clearance around the Base Station.

Figure 2: Clearance for the Base Station



Mounting a Base Station

1. Fasten the bracket into position using two 4-cm screws.
2. Route the telephone cable from the distribution block through the top (or bottom) opening.
3. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
4. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 15.

Figure 3: Base Station mounting bracket detail**Figure 4: Termination board**

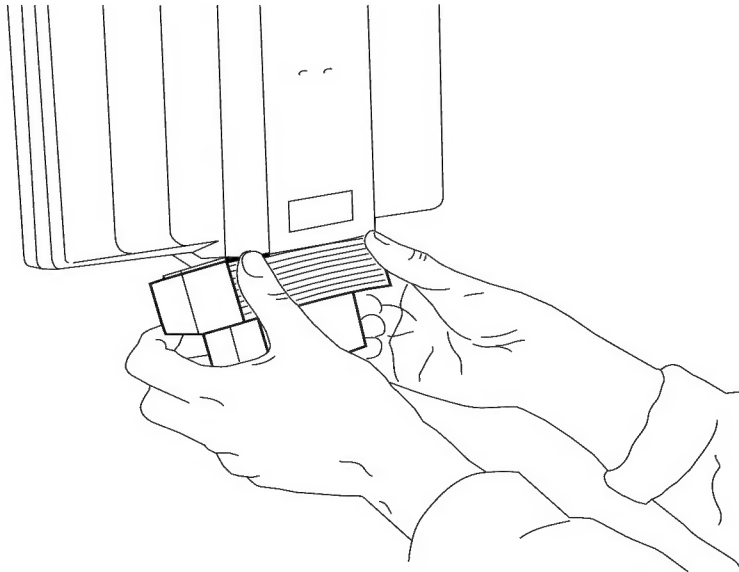
5. Mount the Base Station onto the bracket, snapping it into position.
6. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.

7. Record the associated port number in the space provided on the printed label affixed on the lower right-hand corner of the mounting bracket.

Note: Include the labeling information for each Base Station on the completed installation floor plans and on *Meridian Companion Programming and Provisioning Record* for reference.

8. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 5: Sliding cover onto bracket



Installing remote power interconnect units

Figures 6 and 7 illustrate two possible configuration options using a remote power interconnect (RPI) unit.

Figure 6 shows a configuration that is appropriate for a small installation where there is no main distribution frame (MDF). In this case, the RPI MDF functions as a distribution panel by providing the connections between the Meridian 1 system, Base Station power, and Base Stations. This configuration

can also be used if the existing MDF is full or if the customer wants to keep the wiring separate from the other telephone set wiring.

Note: The polarity of the TCM connections is not important. If *two* power pairs are brought in, they must be connected with the *same polarity* to the termination board.

WARNING!

When using two power pairs, ensure they are connected with the same polarity.

Figure 6: Base Station powering—RPI configuration option 1

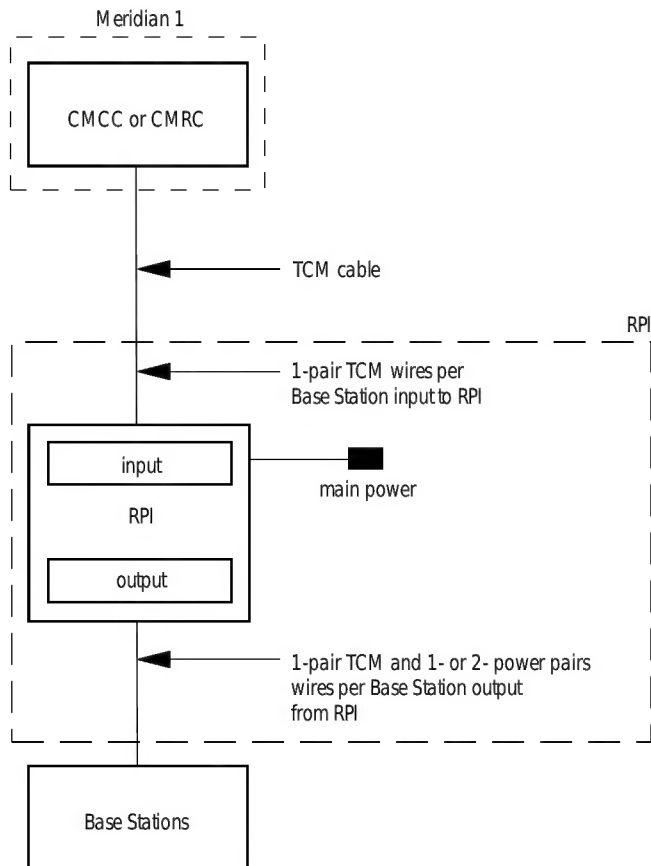
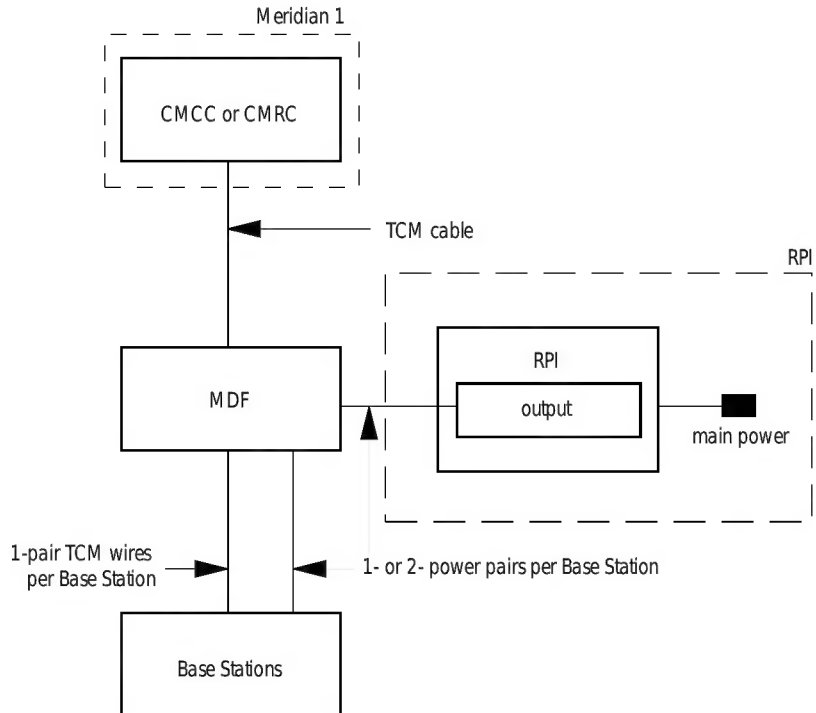


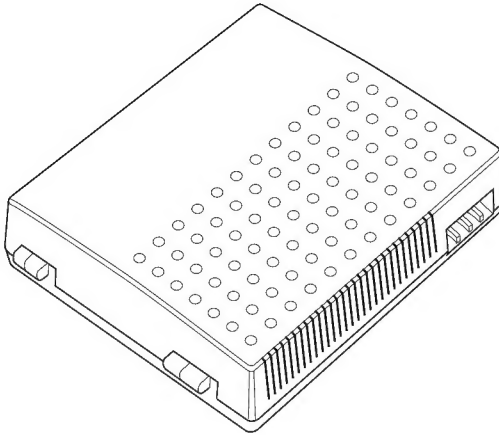
Figure 7 shows a configuration that is suitable for a system that has an existing MDF. Typically, the MDF is located in the same room as the Meridian 1 system, although it could be a closet MDF. In either case, the Base Stations are wired through the MDF rather than the RPI unit.

Figure 7: Base Station powering—RPI configuration option 2



An illustration of an RPI unit appears in Figure 8. Figure 9 illustrates RPI components.

Figure 8: RPI unit



ATTENTION!

The RPI unit should have the DC backup power supplied by a CSA listed UPS.

The UPS should have an output voltage rating of 44 to 50 V DC, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

ATTENTION!

The RPI units must always be installed inside a building.

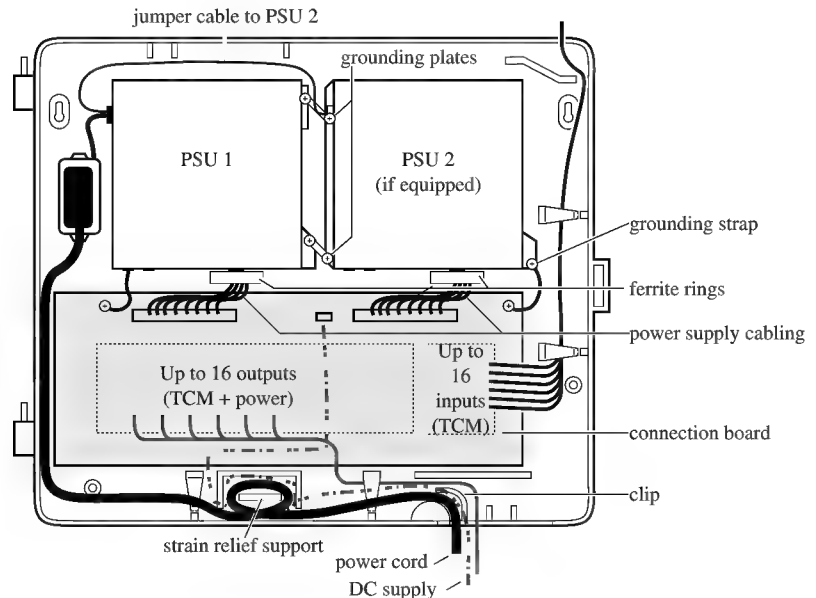
The AC outlet powering the RPI unit should be installed near the equipment and should be easily accessible.

The length of the RPI cord, from the outside surface of the unit to the plug, should be a minimum of 2 m and a maximum of 4.5 m.

ATTENTION!

An RPI unit should not be installed where its outputs are exposed, even when the Base Station is installed with the TCM lines exposed. An RPI unit should be installed in the same building as the Base Stations it supports.

Figure 9: RPI components



There are two versions of the RPI unit: the RPI-8, which supports up to eight Base Stations; and the RPI-16, which supports up to 16 Base Stations. Each RPI has a connection board and either one (RPI-8) or two (RPI-16) power supply units. The maximum input power consumption of an RPI is 240 W. If a UPS 48 V DC backup source is used, the maximum input power requirement of the RPI is 140 W.

You can upgrade an RPI-8 to an RPI-16 by attaching a second power supply unit to the RPI-8 as described on page 30.

To determine the type and number of power supply units you need for a given number of Base Stations, use Table 2 on page 22.

Note: If RPIs are distributed throughout the site, the number and type of RPIs will depend on the placement and powering plan of the Base Stations.

Table 2: RPI requirements

Base Stations	Number of RPI-16 and RPI-8 required
1–8	1 RPI-8
9–16	1 RPI-16
17–24	1 RPI-16 and 1 RPI-8
25–32	2 RPI-16
33–40	2 RPI-16 and 1 RPI-8
41–48	3 RPI-16
49–56	3 RPI-16 and 1 RPI-8
57–64	4 RPI-16
65–72	4 RPI-16 and 1 RPI-8
73–80	5 RPI-16
81–88	5 RPI-16 and 1 RPI-8
89–96	6 RPI-16
97–104	6 RPI-16 and 1 RPI-8
105–112	7 RPI-16
113–120	7 RPI-16 and 1 RPI-8
121–128	8 RPI-16

The system configuration dictates how many RPIs are required.

Installing the RPI unit

1. Mount the RPI as described in “Mounting the remote power interconnect unit” on page 23.
2. Wire the RPI as described in “Wiring the remote power interconnect unit” on page 25.

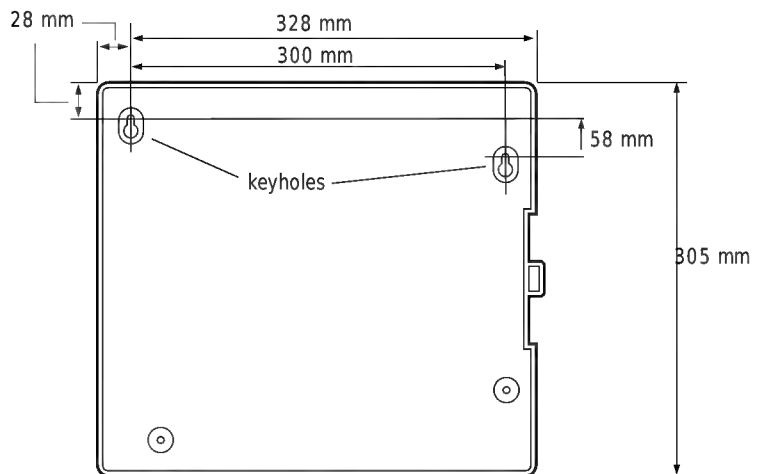
WARNING!

Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

Mounting the remote power interconnect unit

Figure 10: RPI mounting holes



Note: Mounting hardware is not supplied.

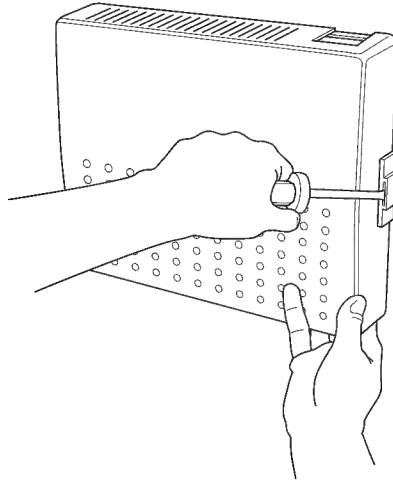
1. Position the screw holes for the RPI using the dimensions shown in Figure 10.

To provide adequate ventilation and to prevent overheating, leave a clearance of at least 13 cm around the RPI.

If mounting two RPIs, one above the other, leave a clearance of at least 30 cm between them to provide adequate ventilation and to prevent overheating.

2. Insert molly screws in the holes.
3. Partially screw in two 4-mm, 5-cm screws for the keyholes.
4. Open the hinged cover with a screwdriver by pushing in and then down to release the catch on the right side, as shown in Figure 11. You can remove the cover by taking it off its hinges.
5. Hang the RPI on the two keyhole screws and tighten them.
6. Install the remaining two screws.
7. Feed in the power cord through the bottom of the RPI and route it through the clip and around the strain relief support as shown in Figure 9.
8. Route the power cord to the input power jack just to the left of PSU 1. Connect the plug to the jack.

Note: Labeling RPIs distinctively may help with diagnosis if there are problems in the future.

Figure 11: Opening the RPI cover

Wiring the remote power interconnect unit

WARNING!

Do not run unprotected power cables outdoors.

The outputs of an RPI unit should not be wired so that its lines are exposed.

The maximum two-way (between the RPI and the Base Station) DC loop resistance for power pairs is *90 ohms*. Each Base Station needs one or two power pairs. The exact number depends on the wire size of the power pairs and the distance between the Base Station and the RPI. Table 3 shows the approximate maximum cabling distances. Remember that interconnections increase the loop resistance.

Table 3: Maximum cabling from RPI to Base Station

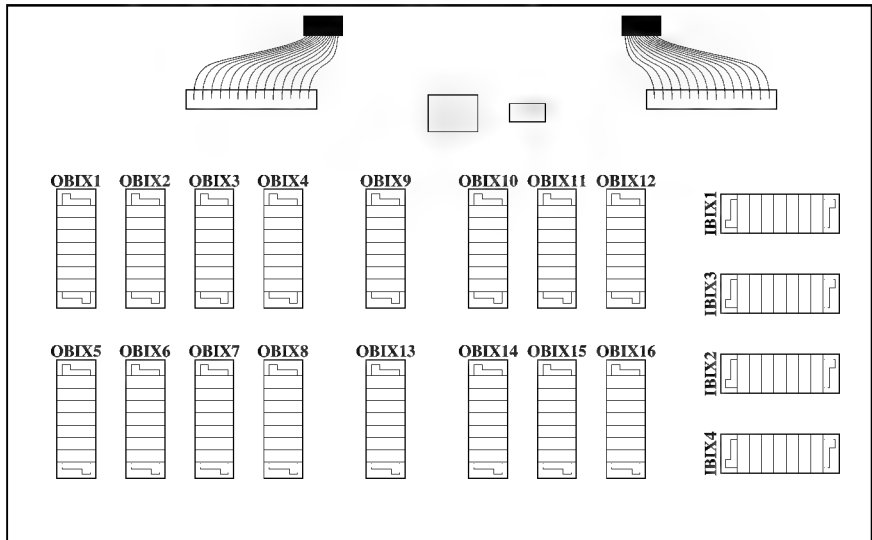
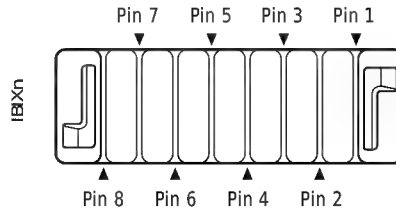
Wire size	Single-pair	Double-pair
0.6 mm (22 AWG)	800 m	1 200 m
0.5 mm (24 AWG)	500 m	1 000 m

Table 3: Maximum cabling from RPI to Base Station

Wire size	Single-pair	Double-pair
0.4 mm (26 AWG)	350 m	700 m

WARNING!

When using two power pairs, ensure they are connected with the same polarity.

Figure 12: RPI BIX connector board**Input connections****Figure 13: BIX input connector pinout****Wiring the remote power interconnect unit**

1. Feed the TCM input pairs through the top of the RPI and route the pairs to the input connectors IBIX1 to IBIX4 as shown in Figure 12. There may be fewer than 16 input pairs in any RPI installation.

2. Connect the TCM pair for each Base Station to the appropriate TCM terminals. BIX connections are indicated in Table 4.

Table 4: Wiring connections

Input connector	Pin	Signal	Output connector
IBIX 1	1, 2	TCM 1	OBIX 1
	3, 4	TCM 2	OBIX2
	5, 6	TCM 3	OBIX3
	7, 8	TCM 4	OBIX4
IBIX2	1, 2	TCM 5	OBIX5
	3, 4	TCM 6	OBIX6
	5, 6	TCM 7	OBIX7
	7, 8	TCM 8	OBIX8
IBIX3	1, 2	TCM 9	OBIX9
	3, 4	TCM 10	OBIX10
	5, 6	TCM 11	OBIX11
	7, 8	TCM 12	OBIX12
IBIX4	1, 2	TCM 13	OBIX13
	3, 4	TCM 14	OBIX14
	5, 6	TCM 15	OBIX15
	7, 8	TCM 16	OBIX16

Output connections

3. Feed the TCM output pairs in through the bottom of the RPI as shown in Figure 12 (see Figure 14 for a close-up of the pinout connection) and route the pairs to the output connectors. If only one pair is used for powering a Base Station, connect the power pair to -PWR(1) and +PWR(1). If two pairs are used to power a Base Station, connect one

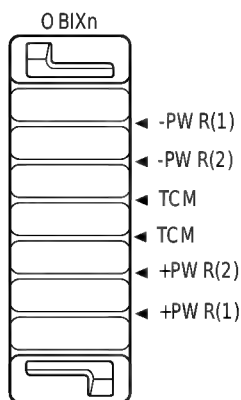
pair to -PWR(1) and +PWR(1), and the second pair to -PWR(2) and +PWR(2).

WARNING!

Ensure both power pairs have the same polarity.

Connecting two power pairs with opposing polarities may damage the Base Station and RPI.

Figure 14: BIX output connector pinout



4. Connect the DC power pair for each Base Station to the power terminals on the same connector as in "Upgrading an RPI-8 to an RPI-16."

WARNING!

Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

Upgrading an RPI-8 to an RPI-16

ATTENTION!

Only distributors and authorized service personnel are permitted to upgrade an RPI-8.

The RPI-8, which has only one power supply unit, has grounding straps and plates fitted so it can be upgraded to an RPI-16 (see Figure 9 on page 21).

1. Power down the RPI.
2. Unscrew the grounding straps and plates.
3. Add the second power supply unit and screw down the grounding straps, the grounding plates, and the power supply unit.
4. Plug the output of the power supply unit into the connector board.
5. Connect the jumper lead from PSU 1 to the lead from PSU 2.
6. Power up the RPI.

Note: The DC power supply passes through the clip and strain relief support, as shown in Figure 9 on page 21, before connecting to the terminal block by 16 AWG wire.

ATTENTION!

The RPI unit should have the DC backup power supplied by a CSA listed UPS.

The UPS should have an output voltage rating of 44 to 50 V DC, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

Mounting a Base Station plug-top power supply

Position a Base Station within 2 m of an AC outlet, since the plug-top power supply has a 2 m cord. Keep these points in mind:

- the power supply must be located in an area accessible to a properly grounded AC outlet
- the input plug is part of the power supply (the only way to remove power is to disconnect the power supply)
- if you must install a new AC outlet to accommodate the power supply, ensure that the AC outlet is mounted with enough clearance to plug the power supply
- if more than one Base Station is installed at a cell center, ensure that each power supply has a separate AC outlet

Follow these steps to mount a plug-top power supply:

1. Fasten the bracket into position using two 4-cm screws.
2. Route the power supply cord through the bottom (or top) opening and under the strain relief of the bracket.
3. Route the telephone cable from the distribution block through the top (or bottom) opening.
4. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
5. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 15.
6. Mount the Base Station onto the bracket, snapping it into position.
7. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.

8. Connect the power supply connector to the Base Station power connector.

WARNING!

Inserting the power supply connector in the wrong direction may damage the plug-top power supply and the Base Stations.

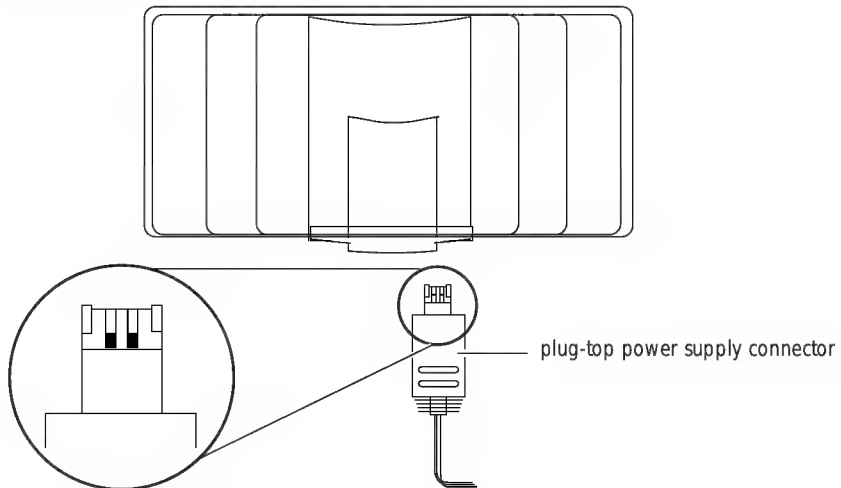
Position the power supply connector in the proper direction and push it into place securely (see Figure 15).



CAUTION!

The Base Station should only be powered up with a class 2 plug-top power source.

Figure 15: Plug-top power supply connector



9. Plug the power supply into the AC outlet. The green light turns on and the red light flashes (if not, see "Troubleshooting a Base Station" on page 159).

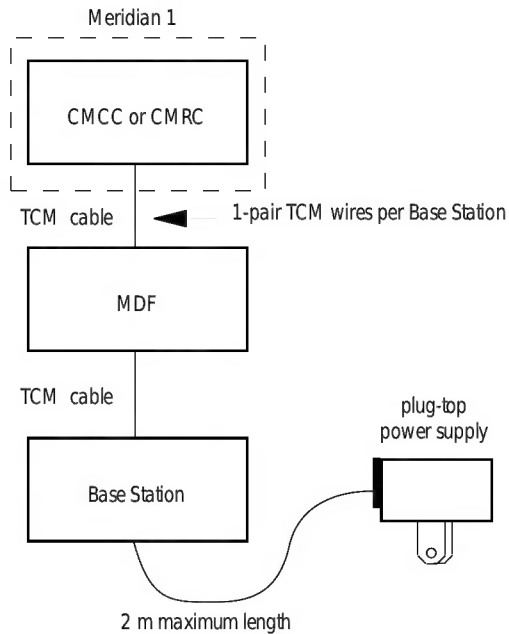
10. Record the associated port number in the space provided on the printed label affixed on the lower right-hand corner of the mounting bracket.

Note: Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

11. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 16 shows a configuration for small installations in which the Base Station is located near an existing AC power source or the Base Station is farther from an RPI unit than 800 m.

Figure 16: Base Station local power



ATTENTION!

The RPI units must always be installed inside a building.

The AC outlet powering the RPI should be installed near the equipment and should be easily accessible.

The length of the RPI cord, from the outside surface of the unit to the plug, should be a minimum of 2 m.

Installing external antennas and lightning surge arrestors

There are three types of external antennas:

- indoor directional
- indoor omnidirectional
- outdoor omnidirectional

There are separate installation procedures for each type. You need to install a lightning surge arrestor for each outdoor omnidirectional external antenna, which is not included with this type of external antenna.

Installation requirements

- If installing an external antenna on a metal surface greater than 18 cm in diameter, position the antenna perpendicular to the surface.
- Always ensure that the antenna is clear of any adjacent obstruction, particularly metal. If more than one external antenna is used at a cell center, the antennas should be spaced at least 0.5 m from each other to avoid radio interference problems.
- When running the coaxial cable inside or outside, take care not to kink, stretch, or crush the cable as which will seriously affect its performance. The minimum recommended bending radius is 20 mm.
- Use RG-58/U coaxial cables to connect the antennas to the Base Stations.

ATTENTION!

Only passive antennas may be connected to the Companion Base Stations.

The coaxial cable connecting the external antenna to a Companion Base Station must have an impedance of 50 ohms.

ATTENTION!

Do not install the external antenna or the lightning surge arrestor during an electrical storm.

Always turn off the Base Station power before connecting the coaxial cable of an outdoor external antenna.

Always install the lightning surge arrestor as close as possible to the cable entry point into the building.

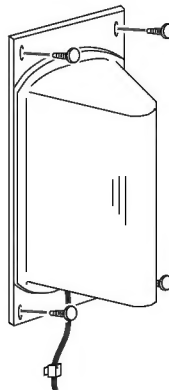
Connect the lightning surge arrestor to ground before connecting the coaxial cable.

Installing an indoor directional external antenna

The indoor directional external antenna comes with its own back plate for mounting. The recommended mounting height on a wall is halfway between the floor and the ceiling.

Note: For some applications (for example, a stairwell), it is possible to mount the antenna on the ceiling.

Figure 17: Indoor directional external antenna



1. Mount the antenna using four screws.
2. To prevent undue stress on the coaxial cable, secure it to the mounting surface.
3. Connect the antenna to the appropriate Base Station radio.

Note: The coaxial cable length must not exceed 10 m.

Installing an indoor omnidirectional external antenna

- Use the bracket supplied to mount the antenna on a wall or ceiling.

Note: Use of a bracket other than the one supplied may not provide the necessary clearance between the floor or wall and the antenna.

- Install the bracket so that the external antenna is vertical. The recommended mounting height on a wall is halfway between the floor and the ceiling.